MARYLAND HISTORICAL TRUST DETERMINATION OF ELIGIBILITY FORM

_	yes	Eligible:	NR
	no		

Property Name: Building 516		Inventory Number:	M: 36-59
Address: Fort Glen Annex	City: Silver Spring Vicinity	Zip Code:	20901
County: Montgomery	USGS Topographic Map: Ken	sington	
Owner: US Army—Department of Defense	Is the pr	operty being evaluated	d a district?yes
Tax Parcel Number: NA Tax Map Number: N	A Tax Account ID Number	er: NA	E 80
	Agency: U		
Site visit by MHT Staff:noX_yes Is the property located within a historic district?		Date: 18	reordary 2010
If the property is within a district	District Inventor	ry Number:	
NR-listed districtyes Eligible district	yes	*:	
Preparer's Recommendation: Contributing resou	rce yes no Non-contr	ributing but eligible in	another context
If the property is not within a district (or the proper Preparer's Recommendation: Eligible X	NT III		
Criteria: X A B C D C	Considerations: A	B C D E	F X G None
Documentation on the property/district is presented in			
Documentation on the property/district is presented in	nomination	i, di ari National Regis	ter of flistorie flaces
Description of Property and Eligibility Determin	ation: (Use continuation sheet if	necessary and attach	map and photo)
			,,
General Description			
Building 516 is a rectangular building com The building is sited atop a full basement at 516 include reinforced concrete, concrete be running bond brick with slight projections if the building is located in the southeast considelights allows access to a small, flat-reperforations along the entry stair, and the notate vestibule into the building. A second of concrete loading dock with a double-leaf, flather area between the pedestrian entry and portion of the east wall. The basement area MARYLAND HISTORICAL TRUST REVIEW Eligibility recommended Eligibility Criteria: XABBCDD	nd is roughly two stories in helock, and a structural steel room the wall plane denoting marner of the structure. A full-pofed vestibule. The east worth wall is fixed glazed units. pening lies in the western poush-panel door sheltered by a the loading dock. A single-has exterior access from the vester of the	neight. Construction of system. The exterior structural elementary of the vestibule. A single-leaf, flustration of the south was metal-clad canopy. leaf, flush-panel dowest. Concrete retains	materials of Building erior of the building is ats. The main entry to oor with transom and is brick with small in panel door opens off all. This opening is a A brick planter spans or lies in the northern ning walls form a long
Comments:			
Andre VAgne	. 7	6/2010	
Reviewer, Office of Preservation Ser	vices 7	21 Jo Date	
Reviewer, NR Program		Date	

Continuation Sheet No. 1

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drive that leads to a large, double-leaf, flush panel door. The retaining walls are topped by metal safety rails. The remainder of the building contains few openings including louvered ventilators in the west and north walls. The addition has one-over-one metal windows, and a single leaf door. The flat roof of the building is trimmed with a metal-coped parapet wall, and a tall vent stack rises from the northeast corner of the building. A metal framed, metal clad, shed-roofed addition is located on the north wall. The addition has one-over-one, double-hung, metal sash windows and a single-leaf passage door.

The interior of Building 516 was heavily modified with the shutdown of the research reactor in 1977 and initial decommissioning. Initial decommissioning included removal of the reactor core, water cooled lead shield, instrumentation, exposure room shield plug, upper shield wall, and filling the reactor pool with concrete. The current interior of the upper level of the building is two stories in height with mezzanines along the north and south walls. The north mezzanine area is used for storage and originally held instrumentation for the reactor. The south mezzanine level contains the glass-enclosed control room, and once also served for storage and conference space. Rooms beneath the south mezzanine originally served as offices and monitoring spaces with a restroom in the center. A monorail crane is supported from the roof of the building and was used for maintenance and fuel handling for the reactor. The upper walls of the main level are covered with acoustic tile. A hydraulically powered hatch is located in the southwest corner of the building and was opened for moving objects from the lower level to the upper. The lower level of the building housed the exposure room, a decontamination room, and a sample preparation room. The large double doors of this level provided truck access to the building. The eight-foot thick shield plug moved along tracks set into the concrete floor of the building. Concrete thickness of the lower level varied from four feet, where an exterior earthen covering afforded additional shielding, to eight feet in the wall between the exposure room and sample preparation room (Geiseler 1977:5-4, 7-3).

Historic Context

The United States Army, Walter Reed Army Medical Center (WRAMC), acquired the assemblage of buildings that once operated as the National Park Seminary in 1942 (see Maryland Determination of Eligibility Form, Forest Glen Annex, Building 136, for a detailed history of the National Park Seminary). The seminary buildings quickly were used for a different function by the Army, with the campus serving as a convalescent facility for World War II soldiers. An interesting description in the Baltimore Sun explains that: "a one-time finishing school for ritzy sweet young things becomes the healer of the sick and maimed, giving the boys in khaki a luxurious but none the less homelike atmosphere to smooth the comeback trail. There's no suggestion of the hospital about it—and for that the men are grateful" (Miller 1972:n.p.). The area was known as the Forest Glen Annex of Walter Reed Army Medical Center.

The original mission of the Forest Glen Annex was to provide space for the convalescent care for military personnel wounded in combat during World War II. This care was provided in the buildings constructed originally for the National Park College. As the need for a large convalescent facility declined in the post war period, Forest Glen Annex obtained other missions. Most of these activities were directly related to medical care and research to support Walter Reed Army Medical Center and included the Army Prosthetics Research Laboratory, Army Audiology and Speech Correction Center, and officer's housing. These activities were established in 1947, and were housed in buildings of the former college. The last medical patients to use the college buildings were admitted during the Vietnam era. In the late 1940s and early 1950s, the Walter Reed Army Institute of Research (WRAIR) embarked on an ambitious expansion with the construction of numerous buildings in the southern portion of Forest Glen Annex, south of Linden Lane. These included new research laboratories, administration buildings, and support facilities. Additional support facilities were constructed in 1971 with the completion of the large community center that included the base exchange, commissary, arts and crafts center, veterinary offices, and an on-post banking location. Most recently, the Walter Reed Army Institute of Research completed an extensive,

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multi-story research facility in the southern portion of the installation. The buildings originally occupied at Forest Glen Annex, including approximately 43 acres of land, were transferred to Montgomery County with the seminary buildings eventually deeded to a private developer for adaptive re-use. In addition to the direct support for Walter Reed Army Medical Center, Forest Glen Annex also provided tenant support for non-medical research. One the most significant tenants was the Diamond Ordnance Company that operated a TRIGA reactor at a location in the southern portion of the installation. The reactor was used to subject small components to both pulse and continuous gamma radiation to evaluate performance in the event of nuclear combat.

General History of Building 516

Building 516 originally housed the Diamond Ordnance Radiation Facility, a research facility that contained a "Training, Research, Isotopes, General Atomics (TRIGA)" Mark F reactor designed by General Atomics. The reactor design incorporated a moveable reactor core fueled by uranium-zirconium-hydride fuel. The reactor was immersed in a large pool that moderated the nuclear reaction and provided a high level of safety to operators and virtually eliminated any possibility of fuel melting. The design stemmed from discussions led by Dr. Edward Teller that called for a research reactor with "inherent safety" that did not rely on mechanical devices or engineering design to prevent a catastrophic accident (General Atomics 2009). The facility was developed during the late 1950s and operations began in 1961 (Gieseler 1977:n.p.). The DORF reactor was used to subject electrical and electronic components with both neutron and gamma radiation to test the resilience of the components to nuclear blasts. The reactor was designed for steady state generation of 250Kw and pulse generation of 2,000 Mw (Health Physics Office 1977:n.p.). Testing took place in the reactor pool, the reactor core, and a 20 x 20 x 8 foot neutron exposure room adjacent to the reactor pool (Geiseler 1977:n.p.). Testing was accomplished by moving the reactor core near to a two-inch thick, water-cooled, lead, shield wall mounted to the tank. A small opening in the shield allowed for the testing of very small components (Health Physics Office n.d.:3-5). Additional shielding was provided in the tank by 18" thick lead doors that could be rotated to allow passage of the core, and closed to isolate the exposure room (Health Physics Office n.d.:3-7). Approximately 35 TRIGA reactors were constructed in the United States with the first reactor constructed by General Atomics operating successfully from 1958 to 1997; it was declared a Nuclear Historic Landmark by the American Nuclear Society in 1985 (General Atomics 2009; American Nuclear Society 2009).

Analysis of Significance and Integrity

Significance

Building 516 was evaluated against National Register Criteria for Evaluation listed at 36 CFR 60.4 and guidance provided by National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation (National Park Service 1991). Additional information on evaluating Building 516 was obtained from Historic Preservation Need with the Operation of Highly Technical or Scientific Facilities (Advisory Council on Historic Preservation 1991). As indicated in Army Real Property Records, the building was completed in 1963, National Register Bulletin 22: Guidelines for Evaluating and Nominating Properties that Have Achieved Significance Within the Past 50 Years was also consulted (National Park Service 1998). Building 516 was evaluated under Criteria A, B, and C. Archival research yielded no information associating Building 516 with important individuals under Criterion B.

In order to meet National Register eligibility requirements under Criterion A, a property must be associated with events that have made a significant contribution to the broad patterns of our history. Building 516 achieves significance under Criterion A for its role in promoting research into how nuclear pulses affected electronic devices and equipment. As one of only 35 TRIGA reactors constructed in the United States, and one of the few last generation Mark F reactors, Building 516, the construction and operation of the reactor was a pivotal development.

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in the early years of experimentation to develop Army materiel that could sustain a nuclear explosion. The period of significance for the building is from its completion ca. 1960 until the initial decommissioning in 1975. At the time of decommissioning, Building 516 held one of only three Army research reactors (Gieseler 1977:n.p.).

In order to meet National Register eligibility requirements under Criterion C, a property must embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values; or represent a significant and distinguishable entity. Building 516 does not possess those characteristics of significance for eligibility under Criterion C. The generic, rectangular, flat-roofed form of the building is typical of industrial facilities constructed during the 1950s and 1960s. Lacking architectural embellishment, Building 516 does not exhibit the necessary features to merit consideration under Criterion C.

Integrity

Although Building 516 underwent extensive modification during the original decommissioning of the reactor in 1975, the building retains high integrity of location; exterior materials, design, and workmanship; and association. Standing on its original site, the building the comprised the physical plant is relatively unaltered and retains original materials, form, scale, massing, rhythm of openings, and spatial relationships. The building has diminished interior and process integrity due to the removal of equipment with residual radioactive contamination. This includes all of the reactor internals, filling of the reactor pool with concrete, removal of all associated piping, demolition of the water-cooled lead shield within the exposure room, the concrete shield plug, and electronic and operational devices in the control room.

Although the removal of this equipment diminishes the integrity of the building, it is also necessary to compare Building 516 with other similar property types, "In instances where it has not been determined what physical features a property must possess in order for it to reflect the significance of a historic context, comparison with similar properties should be undertaken during the evaluation process" (National Park Service 1991:47). This is problematic with Building 516 as there are few comparable properties. Other TRIGA reactors—Mark I, Mark II, and Mark F—have also been heavily modified due to decommissioning activities and modifications over time. This is compounded by the fact, that of the 35 TRIGA reactors constructed in the United States, few were of the Mark F configuration.

With few comparable properties, guidance on rare property types must be considered:

Comparative information is particularly important to consider when evaluating the integrity of a property that is a rare surviving example of its type. . . . The rarity and poor condition, however, of other extant examples of the type may justify accepting a greater degree of alteration or fewer features, provided that enough of the property survives for it to be a significant resource (National Park Service 1991: 47).

With no ability to evaluate the retention of character defining features in other examples of the property type, the diminution of some aspects of integrity at Building 516 is not sufficient to render the property not eligible for National Register consideration. Additionally the building retains sufficient physical evidence, and comprehensive documentary evidence to reconstruct fully all aspects of the plant's construction and operation.

Recommendation

Initial construction of the building began in 1959 and the reactor became operational in 1961 (Gieseler 1977:n.p.). With this date range, the building is on the cusp of reaching the generally accepted 50 year age threshold for National Register Eligibility. While the building will achieve the age necessary for eligibility within the next year, it is possible to assess Building 516 under Criteria Consideration G for properties that have achieved significance

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within the last 50 years. Criteria Consideration G provides an exception to the age rule for those resources of exceptional importance. Exceptional importance is generally considered for events or for rare or fragile examples of specific property types. Resources less than fifty years old must be evaluated against sufficient historic perspective to establish exceptional significance (National Park Service 1991:42; 1998:1-2). The building achieves exceptional improtance for its role in the development of research and testing to develop material resistant to the effects of a nuclear blast and as one of only three research reactors constructed for the U.S. Army.

Building 516 is significant under Criterion A for its association with the development of research and testing for Army weapons systems during the height of the Cold War era. As one of only three research reactors operated by the Army, Building 516 gains additional significance as a rare property type in the Army inventory and possesses exceptional importance under Criteria Consideration G. Although components of the plant were removed during initial decommissioning in 1975 and subsequent salvage and remediation efforts to remove residual radiation contaminated materials, the facility retains sufficient physical integrity, supported by extensive archival evidence, to adequately convey the significance of the plant. The period of significance extends from the completion and initial operation of the reactor in 1961 until its initial decommissioning in 1975. Building 516 retains those characteristics of significance and integrity for National Register consideration.



Continuation Sheet No. 5

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Health Physics Office

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n.d. DORF Reactor Information Packet. Available at Health Physics Office, Water Reed Army Medical Center.

Miller, Nancy (Maryland Historical Trust)

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National Park Service

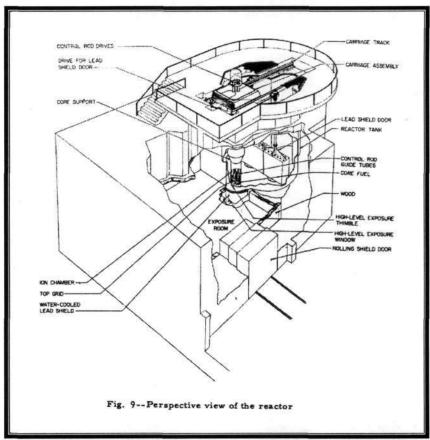
1991 Bulletin 15: How to Apply the National Register Criteria for Evaluation. National Park Service, Washington.

1998 Bulletin 22: Guidelines for Evaluating and Nominating Properties That Have Achieved Significance Within the Last Fifty Years. National Park Service, Washington.

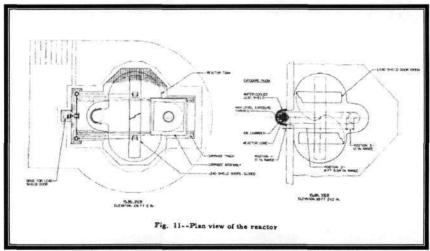
Dean Doerrfeld,	Architectural
Historian	

Prepared by:

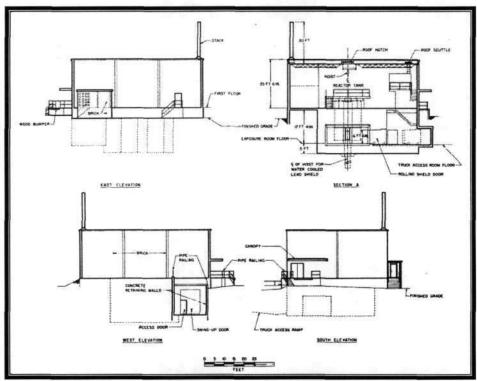
Date Prepared: 24 February 2010



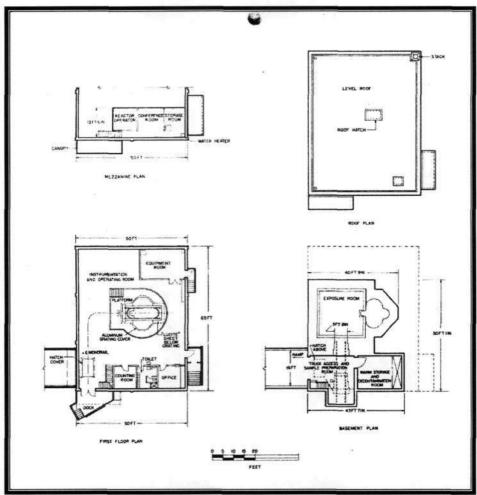
Building 516, view of reactor removed in initial decommissioning, 1977 (Courtesy WRAMC).



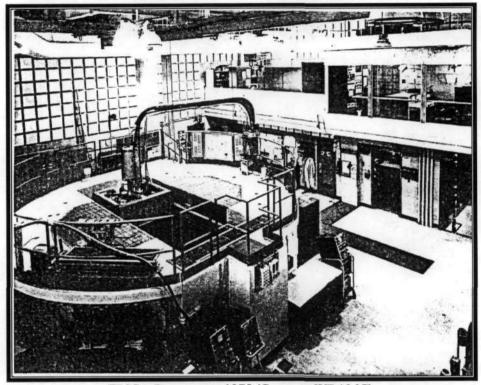
Building 516, plan of reactor (Courtesy WRAMC).



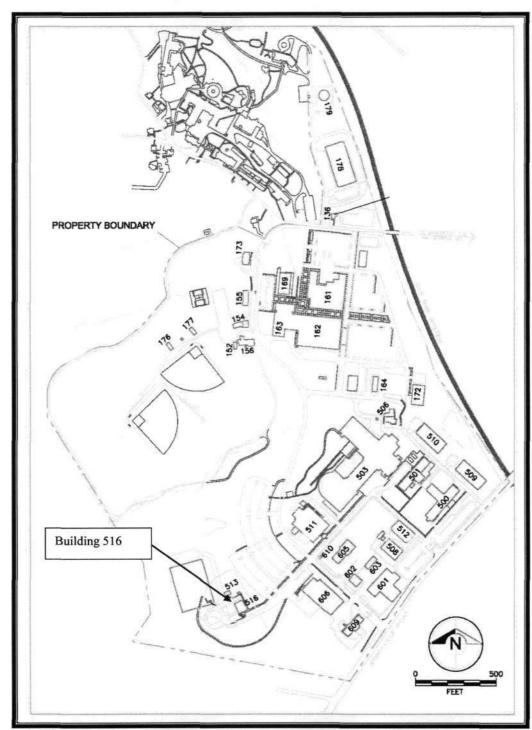
Building 516, section drawings of building (Courtesy WRAMC).



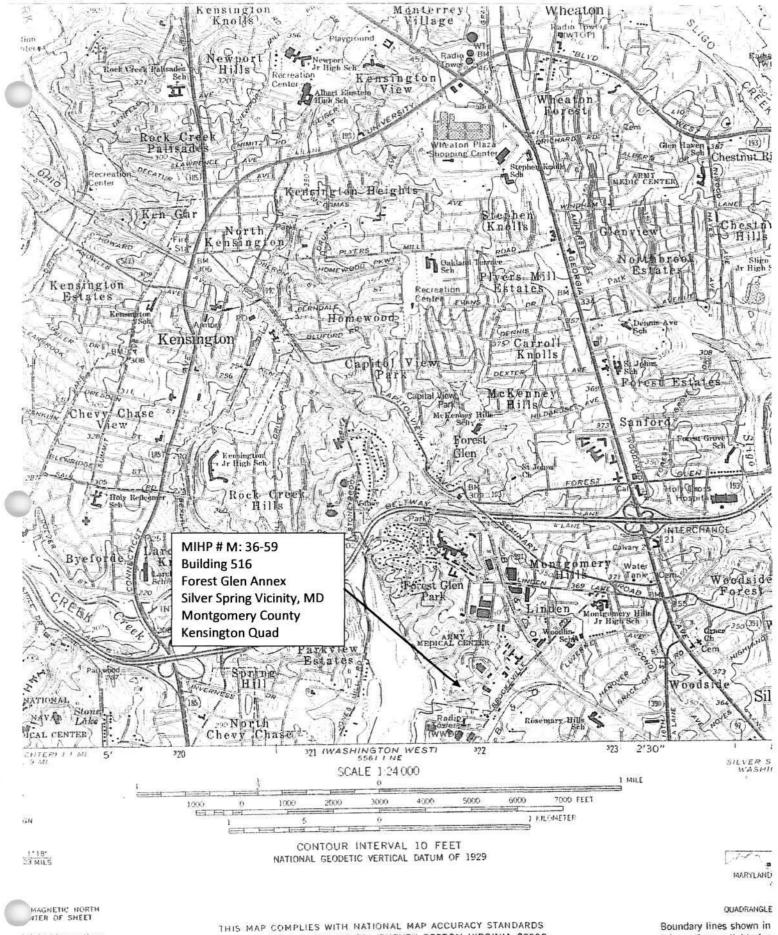
Building 516, original floorplans (Courtesy WRAMC).



TRIGA Reactor, ca. 1975 (Courtesy WRAMC).



Location of Building 516 at Forest Glen Annex (Courtesy Fort Detrick Garrison Environmental Management Office).



I light-blue pattern inundation to 351 feet

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR SALE BY U. S. GEOLOGICAL SURVEY. RESTON, VIRGINIA 22092 A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST Boundary lines shown in information available from Purple tint indicates exter Revisions shown in purpletaken 1977 and other sofield checked. Map edi

MIHP #M: 36-59
Building 516
Forest Glen Annex
Silver Spring Vicinity
Montgomery County, Maryland

Photos taken by: Dean A. Doerrfeld and Rebecca Gatewood
Photo paper and ink: HP Vivera ink 97 Tri-Color cartridge, 101 Blue Photo cartridge, and 102 Gray Photo
cartridge on HP Premium Plus Photo Paper (high gloss) with HP Photosmart 8750 Printer
Verbatim Ultralife Gold Archival Grade CD-R, PhthaloCyanine Dye

Photo Number	Digital Image Number	Date	Description
1	M; 36-59_2009-06- 11_01.tif	06/11/2009	Building 516, view looking northwest.
2	M; 36-59_2009-06- 11_02.tif	06/11/2009	Building 516, south wall detail and upper level loading dock.
3	M; 36-59_2009-06- 11_03.tif	06/11/2009	Building 516, access to basement level.
4	M; 36-59_2009-06- 11_04.tif	06/11/2009	Building 516, view looking west.
5	M; 36-59_2009-06- 11_05.tif	06/11/2009	Building 516, view looking southeast.
6	M; 36-59_2009-06- 11_06.tif	06/11/2009	Building 516, entry detail.
7	M; 36-59_2009-06- 19_07.tif	06/19/2009	Building 516, exposure room.
8	M; 36-59_2009-06- 19_08.tif	06/19/2009	Building 516, exposure room at location of water-cooled, lead shield.
9	M; 36-59_2009-06- 19_09.tif	06/19/2009	Building 516, seal plug opening with seal plug tracks. Note sign above opening indicating location of reactor core and lead shielding.
10	M; 36-59_2009-06- 19_10.tif	06/19/2009	Building 516, hydraulic hatch between basement and reactor floors.
11	M; 36-59_2009-06- 19_11.tif	06/19/2009	Building 516, doors in basement level.
12	M; 36-59_2009-06- 19_12.tif	06/19/2009	Building 516, control room.
13	M; 36-59_2009-06- 19_13.tif	06/19/2009	Building 516, reactor level with acoustic panels.
14	M; 36-59_2009-06- 19_14.tif	06/19/2009	Building 516, overhead crane in structure on reactor floor.



MIHP#M: 36-59 BUILDING 516

FOREST GLEN ANNEX
MONTGOMERY COUNTY, MD
PHOTO BY: RC GOODWIN+ASSOC.

6/11/09

NEGATIVES: MD SHPO
BUILDING 516, VIEW LOOKING NORTHWEST

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MIHP#M: 36-59 BUILDING 516 FOREST GLEN ANNEX MONTGOMERY COUNTY, MD PHOTO BY: RE GOODWIN +XSSOC.

6/11/09

NEGATIVES: MO SHPO BUILDING 516, SOUTH WALL DETAIL AND UPPER LEVEL LOADING DOCK

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BUILDING 519
FOREST GLEN ANNEX
MONTGOMERY COUNTY, MO
PHOTO BY: RC GOODWIN *ASSOC.

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NEGATIVES: MD SHPO

BUILDING 516, ACCESS TO BASEMENT LEVEL
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MIHP #M: 36-59
BUILDING 519
FOREST GLEN ANNEX
MONTGOMERY COUNTY, MD
PHOTO BY: RC GOODWIN *ASSOC.
NEGATIVES: MD SHPO
BUILDING 516, VIEW LOOKING WEST
HOF 14

DIGITAL IMAGE: M; 36-59_ 2009-06-11-04.+if





MIHP#M: 36-59 BUILDING 519

FOREST GLEN ANNEX MONTGOMERY COUNTY, MD

PHOTO BY: RC GOODWIN + ASSOC. 6/11/09

NEGATIES: MD SHPO

BUILDING 516, VIEW LOOKING SOUTHEAST

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MIHP#M: 36-59
BUILDING 519
FOREST GLEN ANNEX
MONTGOMERY COUNTY, MD
PHOTO BY RC GODDIN + ASSOC.
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NEGATIVES: MD SHPO
BUILDING 516, ENTRY DETAIL
6 OF 14
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BUILDING 519
FOREST GLEN ANNEX
MONTGOMERY COUNTY, MD
PHOTO BY: RC GOODWIN ASSOC.

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NEGATIVES: MD SHPO

RULDING 516, EXPOSURE ROOM
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MIHP #M: 36-59 BUILDING 519 FOREST GLEN ANNEX MONTGOMERY COUNTY, MD PHOTO BY: RC GOODWIN "ASSOC. 6/19/09 NEGATIVES : MO SHPO BUILDING 516 EXPOSURE ROOM AT LOCATION OF WATER-COOLED, 8 OF 14 DIGITAL IMAGE: M; 36-59_ 2009-06-19-08. +if





MIHP #M: 36-59 . BUILDING 519 FOREST QUENANNEX PHOTO BY: RC GOODWIN + ASSOC. 6/19/09 NEGATIVES: MO SHPO BUILDING 516, SEAL PLUG OPENING WITH SEAL PLUG TRACKS NOTE SIGN ABOVE OPENING INDICATING LOCATION OF REACTOR CORE AND LEAD SHIELDING 9 OF 14

DIGITAL IMAGE: M: 36-59_ 2009-06-19-09, +if





MIHP#M: 36-59
BUILDING 519
FOREST GLEN ANNEX
MONTGOMERY COUNTY, MD
PHOTO BY: RC GOODWIN & ASSOC.

NEGATIVES : MD SHPO

AND REACTOR FLOORS

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DIGITAL IMAGE: M; 36-59_2009-06-19_10. +if





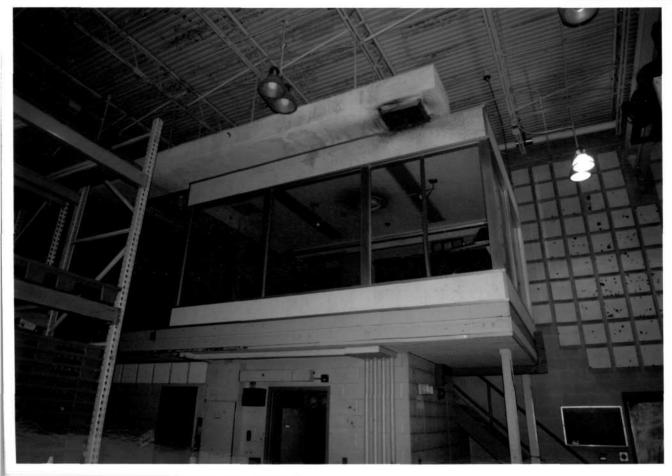


11 OF 14

MIHP #M: 36-59 BUILDING 519 FOREST GLEN ANNEX MONTGOMERY COUNTY, MD PHOTO BY: RC GOODWIN+ASSOC. 6/19/09 NEGATIVES: MO SHPO BUILDING 516, DOORS IN BASEMENT LEVEL

DIGITAL IMAGE: M, 36-59_ 2009-06-19-11.+if







MIHP#M: 36-59
BUILDING 519
FOREST GLEN ANNEX
MONTGOMERY COUNTY, MD
PHOTO BY: RC GOODWIN TASSOC.
6/19/09
NEGATIVES: MD SHPO

12 OF 14 516, CONTROL ROOM

DIGITAL IMAGE: M. 36-59_ 2009-06-19-12.+if





MIHP#M: 36-59 BUILDING 519 FOREST GLEN ANNEX MONTGOMERY COUNTY MD PHOTO BY: RC GOODWIN + ASSOC. 6/19/09 NEGATIVES: MD SHPO BUILDING 516 REACTOR LEVEL WITH ACOUSTIC PANELS DIGITAL IMAGE: M; 36-59-2009-06-19-13. tif



M HP #M:36-59 BUILDING 519 FOREST GLEN ANNEX MONTGOMERY COUNTY, MD PHOTO BY: RC GOODWIN + ASSOC. 6/19/09 NEGATIVES: MD SHPO BUILDING 516, OVERHEAD CRANE IN STRUCTURE ON 14 of 14 DIGITAL IMAGE: M, 36-59-2009-06-19-4. tif